



UNDERSTANDING VIRTUAL PEDAGOGIES FOR CONTEMPORARY TEACHING & LEARNING

AN IDEASLAB WHITE PAPER



The Author

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Virtual Pedagogies for Contemporary Teaching

A model for Collective Knowledge Construction

Living and learning in a technology-rich world changes everything. Well it should... but too often, the results haven't always been as expected. The living part is of course, the way we all now complete our daily routines; there is nothing we do that is not touched by the ubiquity of technology in every facet of our lives.

It's the learning part that is problematic.

We've lived in a technology-sparse environment in education for so long that we have forgotten what expectations we might have had at one time for how learning would be transformed as technology immersed our schools, and beyond. On one level we should not be surprised, because it has taken us so long to leave behind old assumptions about technology access belonging to a lab or being shared, rather than being a truly personal experience. We will surely look back in years to come and wonder how we ever believed the learning environments for young people at the end of the first decade of the 21st Century should not have been truly technology-rich.

But such has been the (mis)fortune of students and educators alike, who now have the good fortune and opportunity to break new ground, discover new possibilities, as they re-conceptualise the nature of teaching and learning in a technology-rich learning world.

There is so much to explore, so many avenues for ideas...and for many students, so little time; but when setting priorities it would seem there is a somewhat urgent need to better understand the implications for the art and science of teaching and learning within a ubiquitous technology environment. Within that brief, which crosses many dimensions, the place that few have explored is all that might happen in the places you can't feel or touch-the virtual space.

When we explore how we might best describe a contemporary learning environment, it usually begins by outlining a blend of the physical and virtual space, and yet, to date, we really have little knowledge of exactly what happens, or even more importantly, might happen, in that virtual space.

This paper is a first step in helping us explore that space and better understand the nature of teaching and learning there, and what might now be possible. What changes when teaching and learning take place in a technology-rich world? Specifically what changes when the medium for teaching and learning is virtual? How does it impact on the norms we take for granted in the physical space, and to what extent does it extend, and grant us a more diverse range of possibilities when we are in a virtual place?

Unquestionably, a lot that happens in the virtual space often mimics our face-to-face behavior, but one only has to consider how technologies such as SMS, Facebook and Twitter have changed how we communicate to contemplate that there might be a lot more that we don't yet understand.

In its purest sense, pedagogy does describe the art and science of teaching and learning per se, and yet as we better develop our knowledge around the learning sciences, emerging technologies and new learning mediums, we begin to unfold new and exciting learning dynamics that we should explore and explain. One of the most powerful of these is the notion of virtual pedagogy, which would seem to underpin much of what we are trying to describe about learning in a technology-rich world, and which also challenges many of our traditional assumptions about effective teaching and learning.

So much of what we have done to date with computers in education has been at the behest of a compromise of access. How can so much of the research in this field be taken seriously when it was completed against a background of unreasonable compromise? Why has so much time, energy and funding been expended on the 'impact of technology on student achievement' when the vast majority of it has been based around minimal access to the technology, and at best, trivial leverage of the opportunities the technology can provide for both teaching and learning?

Perhaps this was a necessary pre-requisite for the 'real thing'; perhaps we were simply giving ourselves a reference point, even if it has been a low one at that, but now that technology ubiquity for learners is seen as both inevitable and fundamental to a young person's right to learn in a digital world, now is the time to lift the bar considerably.

We must stop accepting the behavior of past years of compromised access, and focus our future research around what is now possible in this emerging learning world of technology-richness.

The dynamics of teaching and learning within the virtual space are as diverse as they are complex. We will need to develop tools to better understand them, but in the meantime we can start to build a theoretical framework that allows us to better articulate the experiences and behaviour there. Instead of us seeing the non face-to-face learning space as one of a compromised experience, is it possible that the virtual space might open up new and more powerful pedagogical opportunities that will challenge and possibly even undermine our traditional perspectives around effective teaching and learning?

For instance, in a virtual space, is it possible to share ideas and knowledge more effectively?... and most importantly, in that process, who might be directing the learning? Is it not possible that we can much more easily provide scaffolding for self-directed learning in that space, and accordingly give true meaning to notions of 'learning to learn'? Therefore shouldn't we also be exploring in some detail what the parameters are within a technology-rich learning environment, that most effectively contribute to a student's ability to self-organise and self-direct their learning?

We still too often see teaching and learning in a virtual space as a sort of modern day 'correspondence or external studies course'. It's all about delivery. Too often it's about new mediums being simply used to deliver in old ways. Video has probably been most to blame in this context, and surely our use of video conferencing to date has done much to harm any ideas of pedagogy having any 'virtuality' at all. But as has already been expressed, our longing for what was, rather than what could be, has led us to spend tens of millions of dollars on delivery technologies that were simply about transplanting traditional pedagogy through technology. As popular and valuable as the online video lectures of Professor Lewin's Classical Mechanics course at MIT were, their magic, and attraction were totally a function of exceptional traditional pedagogical expertise, which in the best 'Dead Poet's Society' tradition, seized the day, and the imagination of not only those who had the good fortune to be in his physical lectures, but also the many millions who have since downloaded his many online videos as part of the Open CourseWare project. But is that all there is?...or more importantly is that all that all that could be?

While no-one would want Prof Lewin to tangle his exceptional lectures with the unnecessary use of technology, few possess his pedagogical magic, and for want of that, many could engage a possibly even wider audience in other domains if we could better understand the essential elements of virtual pedagogy, and what it might make possible.

We are only at the very beginning of what these emerging technologies will enable. Twitter, even Facebook, were barely part of our dialogue even five years ago, yet our ability to leverage even the simplest of these emerging technologies in a pedagogical context is tentative, trivial and fragile.

We must do better. As we speak proudly and in clichés of 21st century skills, we are failing to leverage even the simplest of 21st Century technologies; and yet intuitively we seem to know they suggest enormous possibilities. Our best thinking suggests even the technologies we have available to us ubiquitously today could open up enormous possibilities for learners; for the way they connect and communicate; for the way they collaborate and act collectively...and for the quality and diversity of the learning outcomes that arise from those experiences.

How could we discuss ideas around collaboration as an essential contemporary skill and not be leveraging technology as a means and medium for this to be at its most powerful?

So it is therefore contingent on us to better understand virtual pedagogy, and all that it might offer teachers and learners. It is about what we can do better that we could not do before, not just what we do a different way. It is about better understanding the dynamic of teaching and learning in the virtual space and how we might re-think, re-imagine and ultimately transform how learning could and should take place.

Bruce Dixon

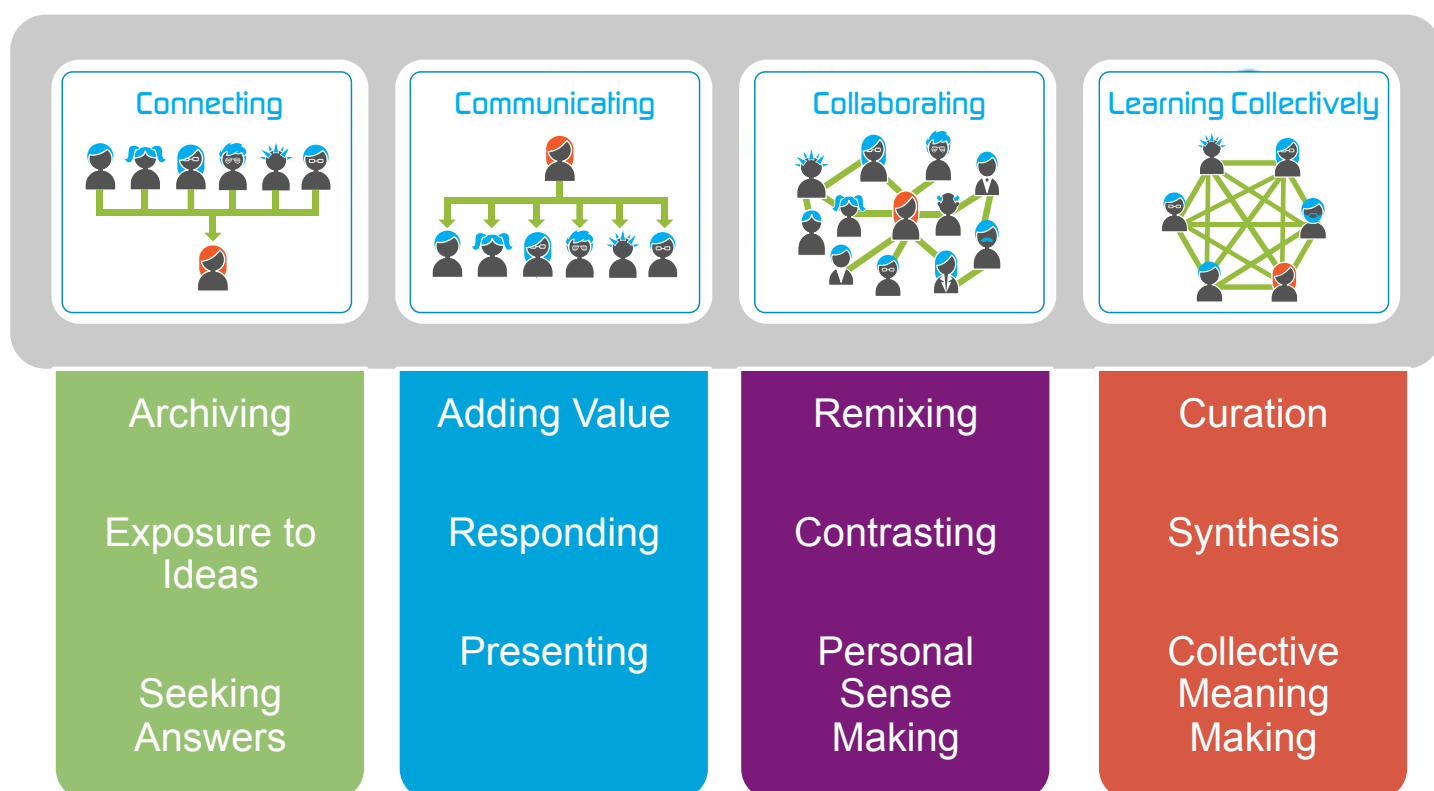
Director, ideasLAB

Introduction

How might we best describe what contemporary teaching and learning looks like?

There is a need for us to have a theoretical model that allows us to better understand our student's use of technology and be much more discriminatory in our use of technology for learning...

Now that our students are living and learning in a technology-rich world, it is important that we are able to more critically discuss and evaluate our practice to ensure our students are getting the most from their online experiences, that they are exploring a whole new array of opportunities for higher-order thinking and learning, and that we fully understand the real value and impact of what is being learnt.



The purpose of this white paper is to use the Collective Knowledge Construction Model to identify strategies by which knowledge construction is facilitated when learning online. And, secondly to encourage teachers, school leaders and other stakeholders to reimagine the pedagogical, technical and contextual consequences that arise from teaching and learning in technology rich environments.

There are four strategies that influence how we learn and the way we behave online, that this white paper explores: Connecting, Communicating, Collaborating and Learning Collectively.

For each strategy we ask:

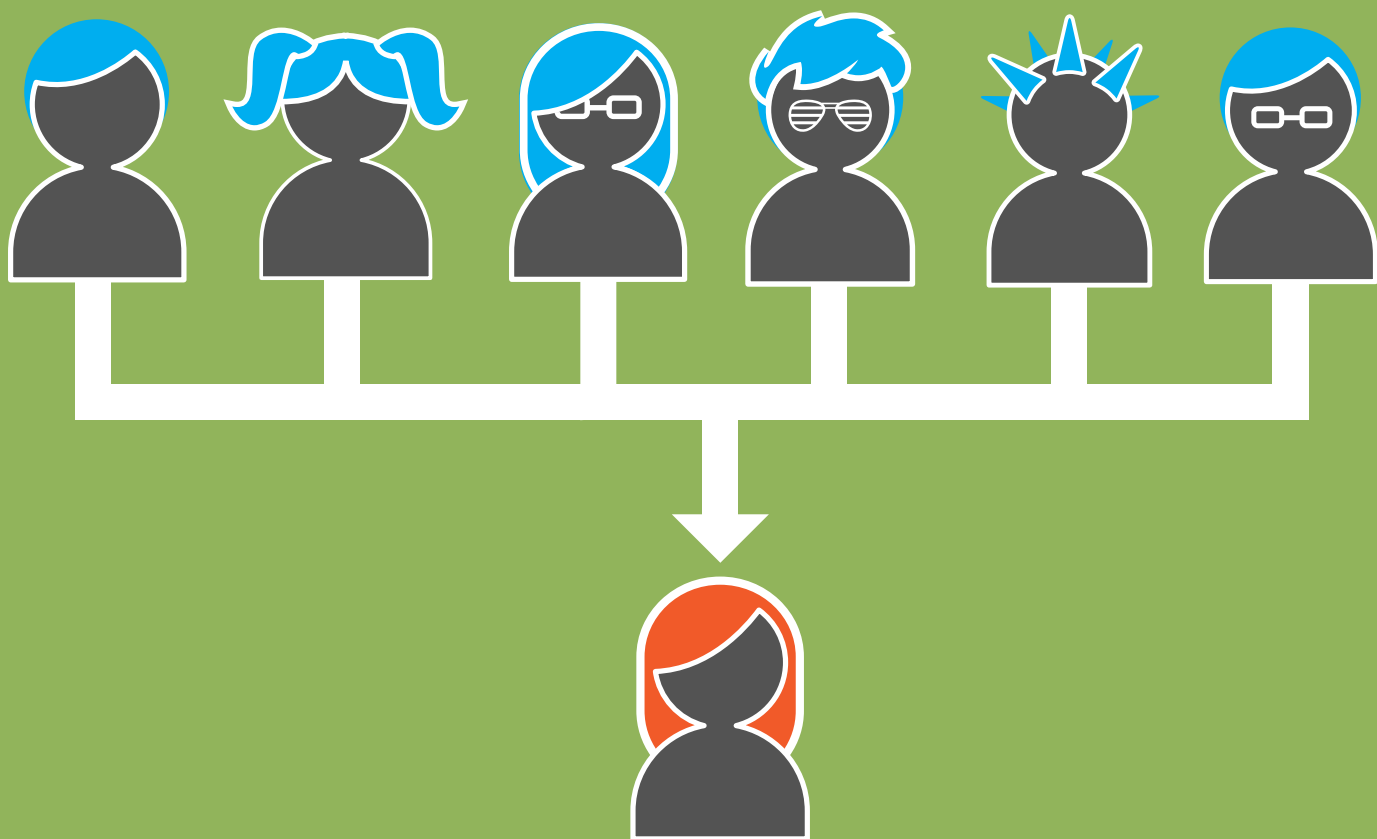
What are the distinguishing features of the strategy?

What pedagogical approaches are suitable?

What are the defining learning activities?

What does the strategy challenge educators to rethink?

Connecting



The web makes it easy to find almost any information. It has dramatically changed how people learn.

Quality content, passionate experts and co-learners are all abundant. Using the Connecting strategy, learners use the web for **research, just in time learning** and to stay up to date with current developments. These learners may be learning on their own or as part as a formal or informal offline learning community. Learners access archived and broadcasted content and seek tailored content from both machines (smart software) and people.

The pace and depth at which learning happens at this stage can vary. Learners can learn episodically, dipping in as needed, finding what they need and then moving on. They also learn via immersion, developing a daily reading habit by subscribing to content feeds from a variety of sources and containing a wide range of views and opinions. They pursue sidetracks, when their interest is piqued, sometimes noting for later investigation, other times postponing what they were doing to follow this new learning.

While this strategy is more likely associated with active information seeking, learning can also be passive. Learners can “follow” experts and other learners, using a range of social media, where streams of information are presented to the passive learner who in turn can choose to respond or ignore. Additionally, the content and information is not always sourced from others. Smart software can provide facts and guide learners through self-paced tutorials, while service applications provide answer-based user inputs, such as providing maps and directions.

The type of learning content can take many forms from text, audio and video through to specific purpose built applications, delivered either in real time or on demand. The length of this content also varies from complete high quality lecture series from the world's leading educational institutions through to smaller chunks of learning content which teach a specific skill or concept. Applications can also deliver content, from simple applications that deliver information based on user inputs data through to rich interactive applications that walk a learner through a series of learning activities, all of which provide feedback and support. This is the only strategy discussed that has a place for commercial content and curriculum providers, therefore it is understandable that it is also the approach that dominates much of the discussion around providing opportunities for learning in a technology-rich world.

Khan Academy

www.khanacademy.org

Khan Academy is a web site with an organised collection of tutorial videos and practice exercises. Videos are typically 10 to 20 minutes in length and explain a specific concept, after watching the student is able to test their own understanding by taking a test. Students can access any video and set of exercises they can work through the knowledge map that sequences the various concepts in a topic. Students access the 2100 videos more than one million times every month.

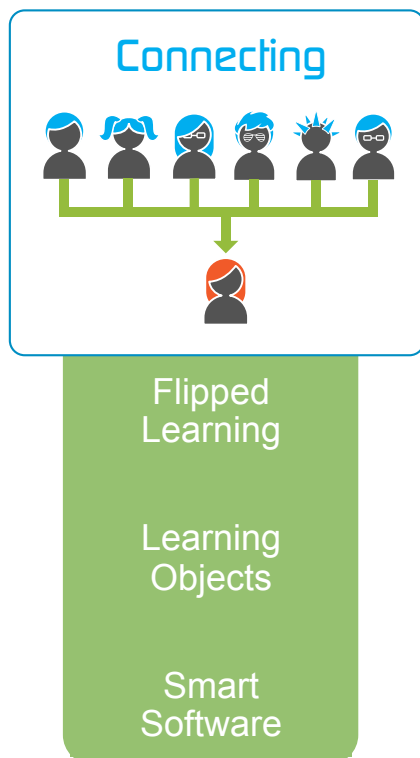


The Commons on Flickr

<http://www.flickr.com/commons>

The Commons on Flickr is an easy way for institutions, such as museums, galleries, libraries and other heritage institutions to publish photos of their collections online. Photos are categorised by their institution but also searchable by title, description and tags. Users of The Commons can also add additional tags to improve the collections. All photos are clearly marked with their copyright conditions, with most of the images having “no copyright restrictions” meaning that they can be used by anyone in any way.





Pedagogical Approaches

The Connecting strategy is **complementary** to the learner's offline learning community and activities. Learners who operate solely in this phase will most likely have access to other learners with whom they can share their ideas and understandings and engage in other learning conversations. The role of the teacher in classrooms operating in this phase will usually not radically change with the teacher still authoritative regarding instruction and assessment.

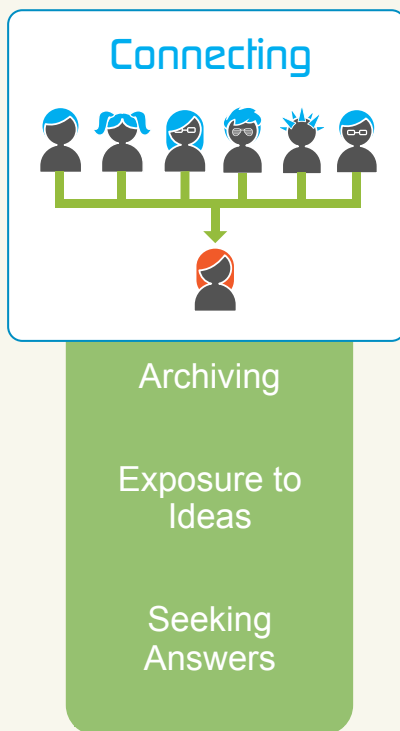
This strategy is also appropriate for offline learning communities that require additional access to experts and expert content. Experts can be accessed synchronously or asynchronously. Synchronously online video, audio or text chat can be used to beam the expert into the offline learning community, allowing learners to interact directly with the expert.

Additionally the Internet can provide access to an extremely diverse range of ideas. Diversity may be found by implementing a daily reading schedule, by exploring hyperlinks or by following learning attention data of experts in the field.

Flipped Learning occurs in classes where teacher instruction is provided before the class instead of during the class. Typically, the teacher creates or sources lesson materials from online experts, which the students access shortly before attending the class. By providing the lesson instruction online and before the class, time is freed up in class for discussion, reflection and learning conversations. Additionally students can return to the lesson materials for revision as needed.

Learning Objects are reusable packaged content that teach a single idea or concept. They can take on many digital formats text, video, sound, simulations and other digital formats. Learners are able to use both individual and a sequence of learning objects for specific learning needs. Learning objects are often located in educational institution repositories, but it is also imagined that learning objects could be built into tools and equipment. Where the equipment itself teaches the user how to use it and provides diagnostic feedback. Mobile devices either with custom applications or web access, allow learners access to a vast amount of just in time knowledge.

Smart Software enables learners to undertake computer-based learning activities in which teacher support is usually required. Smart software might be stand-alone software applications or activity-based web content usually involving self-paced activities or games and often concluding with a post-learning test. Smart software might be used in isolation, designed to teach a whole concept or may be used as a learning activity as part of a large learning sequence.



Learner Online Activities

Over time Internet connected learners can develop a large network of high quality content sources. When drawing on these they can feel confident that they will supply a breadth and depth of information about the topic of interest while also capturing any new information or breakthroughs in the field of study.

Teachers and schools make a conscious design decision about how their students access content and resources. Some schools choose a highly directed environment where it is the teacher's role to direct their students to appropriate resources and content while other schools encourage their students to individually identify reliable information sources.

With this strategy, classes begin to use online spaces to complement their classroom program. This may have a forum where students can interact with each other and continue learning conversations out of school hours. Additionally, teachers may make themselves contactable via instant messaging or other technologies so that important questions can be answered immediately.

Archiving Content and Information

Online learners can quickly and easily access information and then save the content for retrieval at a later time. They do this by accessing known trusted sites and learning communities, and using search engines to find content on previously unknown sites. Learners may choose to organise their downloaded content in ways that make later retrieval possible, such as using folders and naming conventions. Other learners use browsers with bookmarking facilities or web-based social bookmarking services like Delicious to organise learning content.

Learners use tags and keywords that they associate with their content in order to easily retrieve information and over time, a personal knowledge base is built up that can be drawn upon. While most tags describe the content, other tags such as "toread" identify the function, ie. "to be read at a later date."

Exposure to Ideas

In order to locate required content, learners need to have developed **search skills** including expanding searches, narrowing searches and pearl harvesting.

Learners in this phase may also begin to subscribe to RSS feeds and keyword searches so that they are notified when new content is produced rather than having to search for it.

These learners begin to develop strategies beyond using search engines, such as using tags and keywords to find and monitor content. They identify online communities that are useful for finding specific information.

They subscribe to RSS feeds and keywords searches, and begin using additional social media tools that aggregate content in real time. They follow experts in the field, and follow others who the experts recommend. They utilise recommendations to identify which content to investigate and which content to filter out.

Seeking Answers Websites and other social media are used to ask questions and **seek answers**. In **Seeking Information** learners move beyond searching and use forums and other social websites and services to ask questions and engage with other learners. This is usually necessary only when previous attempts to access content knowledge have failed. Learners seek opinions, advice and clarification, and begin to develop the skills necessary to participate in online learning communities.

Learners use social media, asking questions, either as a broadcast or directly to specific individuals. They use subject-specific web communities to ask general questions, and follow up questions around topics of interest in response to existing discussions.

Additionally, experts are accessed through live video meetings and archived presentations. These presentations may be accessed during a formal class or out of class to complement teaching.

Does anyone know how to...

If I did this would it work?

This isn't working can anyone tell me why?

Rethinking Quality

Schools (and others) who try to compete with the Internet on creating quality content are destined to fail.

If the Connecting Strategy relies on having instant access to high **quality** online information, whose job is it to provide these and ensure we have quality resources?

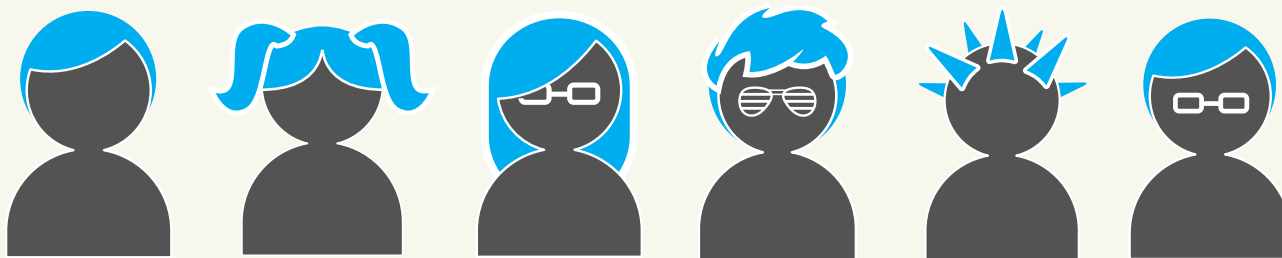
Schools and individual teachers who try to create their own tailored content for their students will find it impossible to compete with the Internet that provides access to an increasingly diverse range of high quality learning content. Additionally, as knowledge changes over time with new information coming to light, and as best practice evolves, schools are much better placed to facilitate and encourage students in sourcing content from external sources.

Schools who create quality control learning repositories are doing their students a disservice.

While it might be tempting for individual teachers and educational institutions to pursue the creation or procurement of a quality-controlled repository of trusted learning objects, it should be resisted. Even if such a task was possible, the rate of change of new information means that ensuring the diversity and quality of the repository is extremely difficult. Similarly, Eli Pariser¹, warns of the **filter bubble**, where content is potentially so personalised through recommendation engines that tailor “perfect” content for a user, that they are shielded from diverse ideas and opinions, leaving them poorer as a result. Unfortunately this is the current climate that our students are often exposed to, as the student’s exposure to quality content is dependent on their teacher.

Critical consumption is a key competency of the 21st century learner.

Additionally, if specifically selected or created learning content is all that students encounter, will an ability to critically assess the quality of the information be developed? Evaluating whether information accessed is accurate and identifying which content or content providers to subscribe to is critical at this phase. Traditional **critical consumption** methods such as examining the qualifications of the author are often not applicable where authorship is missing or misrepresented, nor can we dismiss the rise of the passionate and knowledgeable amateur. Instead, schools need to help develop online learners who are highly critical consumers, using multiple sources to verify information, or better still leverage networks to help identify quality.



Rethinking Access

Providing a device for every student and minimally filtered access to the Internet is vital.

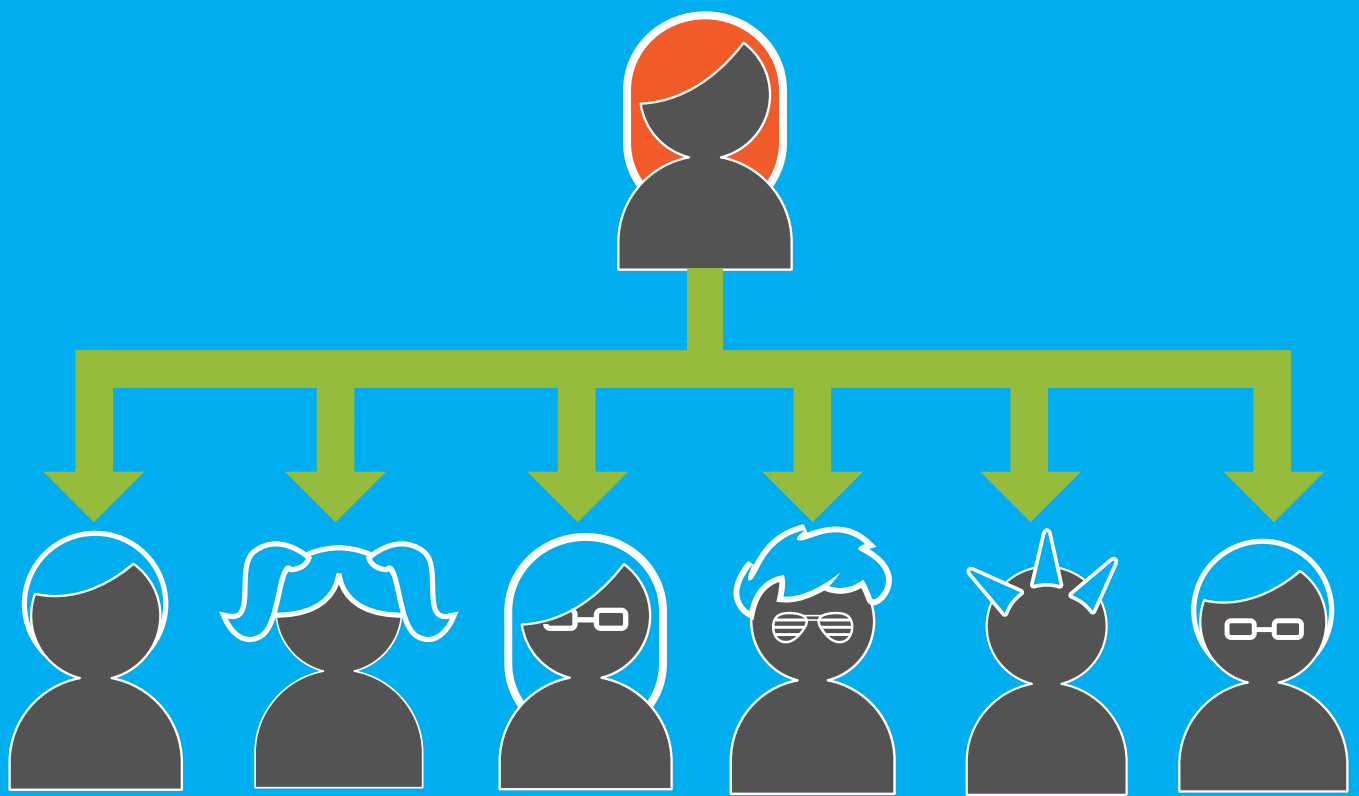
Having student **access** to online information is critical. Many educational institutions are simply not prepared for students for whom “searching for the answer” is their first problem solving strategy. Schools need to provide access to devices, with mobile devices particularly useful for the quick look up of information. They must allow their students to access their devices whenever they are required. Consistent with the earlier rational, they should implement minimal Internet filtering, especially providing access to social tools and websites.

Schools need to respond to the fact that being able to quickly retrieve information is the same as knowing it.

Additionally, schools need to respond to the **nature of knowledge**; what needs to be known, and how knowledge is stored needs to be re-imagined in our 21st century world. As Clark and Chambers argue with their concept of the Extended Mind, knowing something is the same as being able to quickly and accurately find the same information. The catch-cry of the personal learning network evangelists, “I store my knowledge in my friends,” echoes similar sentiments that being able to find information is virtually indistinguishable from being able to instantly recall it. Mark Pesce argues that we are at the point of mid-singularity, where the influence of ubiquitous smart technologies on our lives is irrevocably all pervasive and its impact so profound, with the only certainty being that this we will become more dependent on them.

Rather than banning mobile devices, schools need to respond to a life profoundly and irrevocably influenced by them.

Despite this, schools routinely ban student mobile phones, requiring students to hand them in at the start of the day and collect them at the end of the school day, as if school was some bastion that ubiquitous smart technologies had not yet breached. ..almost a sanctuary from the ubiquity of technology. Schools not only need to allow students to use their mobile devices whenever they are needed, they need to ensure that every student has a device and additionally move away from content centric learning, namely learning activities and assessment that involves collection, memorisation and recall. Concern about the effective use of devices, and the appropriate behaviour that underpins such use, should not distract teachers from the possibilities they provide for creating powerful learning opportunities.



Communicating

Communicating

The web makes publishing easy. Anyone can publish almost anything quickly and easily for little cost.

The rise of Web 2.0 with blogs and wikis, not to mention Facebook and Twitter, has resulted in content that is accessible to almost 2 billion of the world's population. Using these tools and websites, finding and engaging with an audience is generally easy, admittedly with most people communicating with those that they already know offline.

Using the Communicating strategy learners move beyond using the Internet for knowledge acquisition and begin publishing their own content to present their achievements and reflect upon their ideas and understanding. Learners publish information to the web, in both written and multimedia formats, expecting others to respond to create an online conversation.

They **reflect** on their learning and **report** their experiences. They seek and give clarification around their ideas and their points of view.

These learners invite feedback on their work and ideas and view this as a crucial for improving the quality of their work and ideas. Feedback often takes the form of comments written in response to the learner created content but also takes other forms of affirmation such as “liking” the content, adding tags or keywords that help others to locate the information, or link to the content through services like Twitter or Facebook’s **like**. Learners at this phase also provide feedback to other learners through comments and other means. Through these activities a sense of community can be developed with other learners. It is important to acknowledge the social impact of this work, rather than too often be distracted by discussion around the technologies themselves. It is the ability that learners now have to communicate with others in so many diverse and accessible ways through new technologies, that is driving this strategy, in stark contrast to earlier ideas about computer access limiting with our social experiences.

For the learner there is an emergent sense of online identity, such as “being searchable,” and published work that shows the range of knowledge, skills and experience that they have accumulated. However, this is not to suggest that all content published is for showcasing success; learners who document and publish their learning activities, processes, thoughts and ideas benefit from making their learning process transparent.

Global2

global2.vic.edu.au

Global 2 is a blogging community nurtured by the Victorian Department of Education and Early Childhood Development. Students are able to post high quality work samples as well as reflections on their work and new understandings. Students are able to use a range of digital multimedia such as text, sound and video. Parents and the wider community are encouraged to comment on the student posts and provide encouragement and feedback. By using blogs the wider school community is able access the content as it is produced.

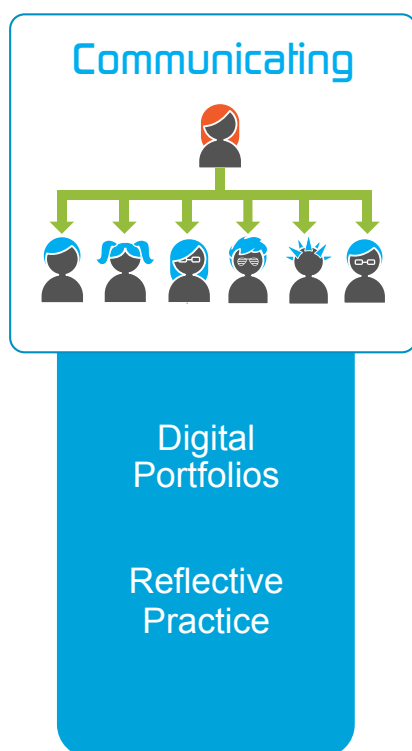


Delicious

delicious.com

Delicious, a social bookmarking service is a powerful and convenient way to organize web-based resources. Users are able to use tags to categorize their content and additionally add notes. Users can make their content public, allowing other users access to the categorized content. As the bookmarks are stored on the web, users can access them **from any Internet connected device. Schools may choose to use public Internet sites or host their own using private alternatives.** Social bookmarking is a powerful and convenient way to organize web-based resources. Users are able to use tags to categorize their content and additionally add notes. Users can make their content public, allowing other users access to the categorized content. As the bookmarks are stored on the web, users can access them from any Internet connected device. Schools may choose to use public Internet sites or host their own using private alternatives.





Pedagogical Approaches

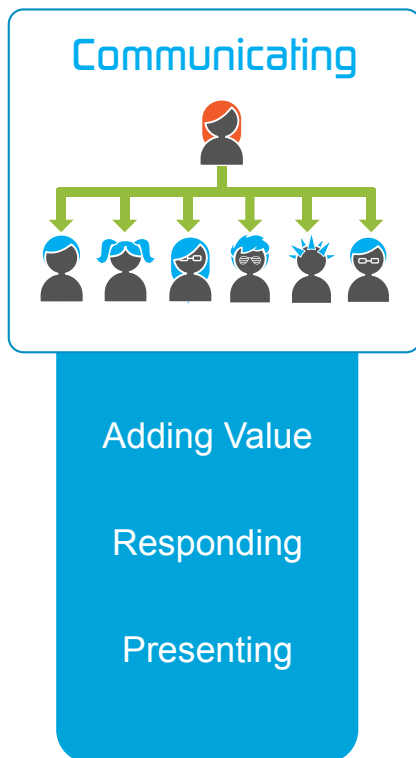
The **communicating** strategy can be complementary to the offline class and learning community, however it can also be used to profoundly change its form and format. Learners who operate solely at this phase likely see the Internet as a platform to **broadcast** their ideas, understandings and competencies to an audience usually comprising teachers, peers and family. They showcase their success through publishing **artifacts** in text, photos, videos and other multimedia. These learners invite and expect others to respond to their content via comments and/or hyper-linked content with the learner then engaging in conversation.

Schools encourage a communicating strategy by providing spaces for students to **communicate**; these can be public spaces, which anyone can access, or private spaces where other approved users can access the content. These online spaces help provide greater transparency and help to forge stronger links between home, school and wider community.

Creating an environment for transparent student directed assessment is a major goal of this strategy, with the presented artifacts not only providing an assessment of the student's learning but also providing feedback from which current learning can be improved.

Digital Portfolios (also known as eportfolios) are an electronic collection of exemplary student work that showcases the student's understandings, ideas and competencies. Typically a digital portfolio would be formatted as prescribed by the educational institution and would be a key component in assessing the student's competencies. Increasingly schools are using web publishing as a simple yet powerful way to create digital portfolios. It also provides a more open approach for a portfolio to embrace learning in both formal (school) and informal places. A digital portfolio is created by the student and comprised of work that the student self-selects. Not only does the digital portfolio give a clear picture of student progress but also provide students with the opportunity to reflect on their learning.

Reflective Practice involves analysing learning experiences so that opportunities for improvement can be identified and subsequently implemented. Online publishing, blogging in particular, has strong correlations with reflective practice. By blogging, keeping a chronological online journal, students can document and reflect on their experiences and invite others to provide feedback through comments on the posts. Learners using blogging as a reflective practice, are encouraged to write regularly, possibly in scheduled times and from a personal reflective perspective.



Learner Online Activities

Over time learners who publish and engage in conversations can develop an online web-presence. This presence or identity is developed not only by publishing their own content but also through responding to the content of others. They may communicate by creating their own online spaces, often through a blog or they can create an account on one of the many social publishing services.

Teachers and schools make conscious design choices about how their students communicate online.

Some schools choose to implement private communities where students can publish safely in the knowledge that their audience is known and trusted. At the opposite end of the spectrum, others schools allow students the freedom to select their own publishing environment from the plethora of self-publishing options. Additionally some schools may choose to implement a single class blog or publishing space while others encourage their students to create individual spaces. These choices directly impact the audience and the diversity of feedback that the learner will receive.

Classes use online publishing to **complement** their classroom program. Although students are most likely reflecting on classroom learning experiences, by encouraging feedback from an online readership these classes are encouraging feedback from external sources.

Adding Value

Online learners can add value and improve any online content. They move beyond mere archiving of content for solely personal benefit and begin to add value to content that benefits others. They use social bookmarking, feed readers and reposting on social media, to **share**, **archive** and **catalogue** information. Over time these collections can become quite useful for accessing and retrieving diverse content for others as well as the original tagger.

Learners use tags and keywords that are not only useful personally, by identifying and adhering to shared-norms benefit a wider learning community. Tags may also be used to highlight content for a specific user. For example, tagging something with “forjill” will let Jill know that she may find the content of value. They add value to content by “liking” and “reposting” to indicate that they believe the content has merit or is high quality. They publish links to content using web services such as Twitter, adding additional accompanying text as recommendation or critique.

A great read, thanks for sharing.

Well done, sounds like a great experience.

Just finished reading this, highly recommended.

Responding

Online learners respond to other learners in a variety of ways. They comment on the learner's shared ideas and work, they create own pieces in response, and they provide answers and advice. Using this strategy learners begin to take on the role of the “more knowledgeable other.” They give guided advice to other learners and they create and publish tutorials and other learning content that not only showcase what they know but also to assist others.

When responding learners make statements and reflections around their own understandings and ideas. They write blog posts, comment in forums, and engage in conversations using other social media. At this phase, students are not engaging with the ideas of others beyond agreement or disagreement or relating to their own set of experiences.

Have you thought about doing....

That is the way that....

I'd suggest that you could....

Presenting

Online learners create their own online spaces to share their **ideas**, **experiences** and **points of view**. They write detailed posts presenting not only their completed projects but also the progress of their projects. Their posts provide an opportunity to reflect on their learning activities and invite feedback, suggestions and advice from others. They organise their content with tags and categories in order to add coherence, for the benefit of others as well as themselves. They also present their ideas, experiences and points of view in public spaces, replying to other learner's content and engaging in online conversations.

Learners also present their ideas and understanding in ways other than text. They create video, audio and multi-media presentations that demonstrate a concept or make a case for an idea. By building up a rich collection of content, the learner is able to demonstrate passions and competencies.

I think...

I believe...

I did....

Rethinking Publishing

It is not simply about finding an audience, it is about joining a conversation.

Although the communicating strategy is characterised by student online publishing, it must be stated that publishing online is not the same as publishing offline. It is easy for teachers, students and parents to be caught up with the fact that a student's work is being read from the corners of the world, but if a “global audience” is the goal then we're doing our students a great disservice. Online publishing is not about broadcasting content but rather **focused conversation** with others. Schools need to encourage students to publish work that is conversational, by encouraging content that is findable, links to external sources and invites feedback.

Students need their own space in order to develop an online identity.

Additionally, schools need to identify the conditions required to promote online conversational publishing. Shared spaces, such as class blogs, do not allow students to develop an online reputation nor an individual identity. Class blogs are about the teacher or the class, students need a space that is their own. By having an individual space, students can develop a body of work that gives a complete record of their learning experiences, with complete ownership over their space they can construct a space that is truly representative of the students interests and competencies.

Online publishing matters little if the student isn't findable.

Whether the student is publishing in a public or private space students and their content need to be findable by those undertaking similar learning. Students can use tags and categories to not only make their content findable for external searchers but also to assist readers find related content. Teachers can use their networks to help their students find an audience, for example #comments4kids is a well used tag for communicating to the online education community that there is student content that is requesting feedback.

Particularly when using private spaces, schools may choose to take a proactive role by aggregating student content so that it is easily findable. Private spaces that make it impossible for students to be findable based on the content of the published work, prevent the communication strategy from being fully realised.

Rethinking Transparency

Communicate the whole learning process not just student achievements.

Schools also need to reimagine what students publish. Rather than simply showcasing student achievements and reflections upon the process as a whole, students should be encouraged to share the entire learning process. Schools should teach and encourage students to share their project ideas, their reflections, their progress and their achievements. School should also consider whether every student should have a blog, a journal where they have the freedom to plan, share and reflect.

Over-filtering prevents transparency.

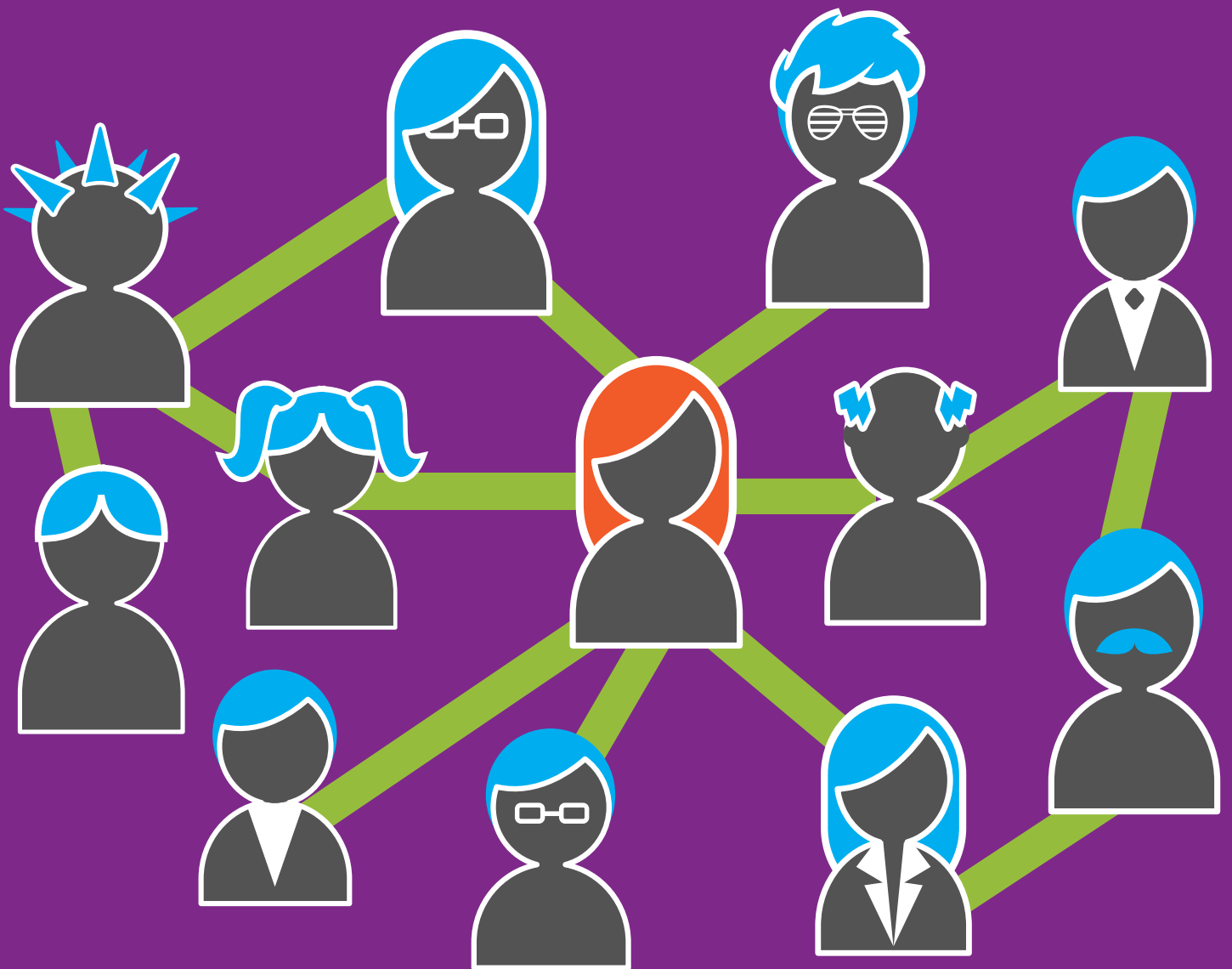
Traditional publishing dictates that editing occurs before publishing, that the author and editor determine the suitability and worth of content before it is published. This is not true of online publishing. Indeed even the way we interact with content has changed; previously content was **pushed** at consumers, whether by formal education or mainstream media, now consumers access content by **pulling** it from trusted sources. Dealing with the vast amount of information available is not possible by consuming more but by filtering more effectively.

The rise of social sharing, activity streams, life blogging and open data have resulted in a deluge of information. Learners can use these streams to share their total learning journey, relying on others who will only access and respond to content that is relevant to them.

Transparency causes the students to become teachers.

George Siemens⁸ suggests that when students “make their learning transparent, they become teachers.” In articulating changes in understanding over time, including retracting previously held beliefs based on new ideas or experiences, the learner not only shares deep insight into the concept but also models effective personal sense making. These are crucial 21st century skills for our students to have, the ability to “make sense” in a world where knowledge is changing and new knowledge is created at a rapid pace.

Collaborating



Collaborating

The web makes it easy to create networks, around a shared points of need or ideas. Through technologies such as RSS and social practices such as following, learners can connect with other learners and experts alike. Networks not only connect people, but they also connect content, utilising the **network effect** to improve the shared ideas, concepts and expertise.

At this phase, learners move beyond communication to become **active online learners**. They see knowledge construction as a **collaborative activity**, taking responsibility not only for their own learning but also taking an active role in the learning of others.

The sense of being part of an online learning community or community of practice is much more apparent, with the learner beginning to consider the learning needs of others and act as a more knowledgeable other.

Learners articulate the change in their own personal understandings, contrasting prior beliefs with new understandings. They consider and respond to contrasting points of view that others may hold. They use the content of others to create new work that either further emphasises the ideas or draws out new ideas.

This type of learning usually requires a learner to have their own online publishing space, such as a blog, in which they can present their ideas and new understandings. Learners may also operate in shared online spaces created around a concept or object and allow subject-specific learning to form. Learners share their ideas using a variety of multi-media formats and link their ideas to the ideas of others that they are contrasting or remixing.

Learning in a community context means that the community, not the individual, sets the current learning agenda. Concepts and ideas that gain traction in these communities are topical, new ideas or related to current events. This may result in learners at times feeling as though the experts drive the current focus. However, this community-led focus ensures that collaborative learners are up to date with current trends, knowledge and ideas.

Scratch Community

scratch.mit.edu

Scratch is a visual programming language for children and is supported by an active online community. Students share their Scratch projects, download and play projects that others have made, ask questions and support others in learning. There is no way to prevent other users from modifying a project and therefore everyone who shares their work recognises that others may re-use, re-work and learn from it. Over time, the community has developed a rich body of knowledge and understandings. More than 600,000 members have created and shared close to two million Scratch projects.

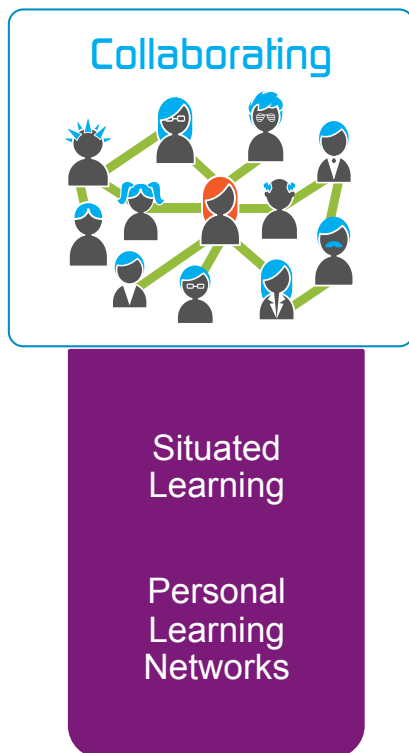


CC Mixer

ccmixter.org

CC Mixer is a music-based online community where musicians and vocalists can share music samples. Other members can use these samples to make complete songs, which are then re-shared with the community for further re-use. Members can also connect and collaborate with others to create compositions. CC Mixer is built on the principles of the creative commons copyright licenses that allows for non-commercial re-use and re-mixing of the music samples. CC Mixer has over 2,500 members, over 2000 original a cappellas and over 10,000 original music samples.





Pedagogical Approaches

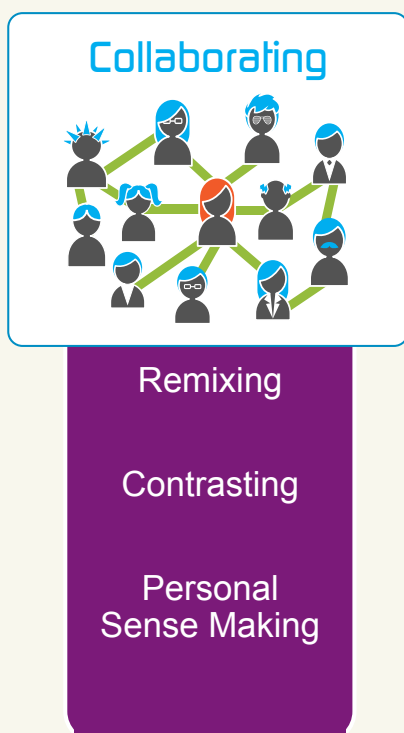
Learners operating at this phase would not necessarily have and do not need the support of an offline learning community. This is not to suggest that the collaborating strategy is not applicable for offline learning communities.

Schools seeking to implement a personalised approach to curriculum design would find it appropriate to implement the **collaborating** strategy, with schools providing the means for students to form supportive collaborative networks where they can share their learning process and support others in their learning.

There are two main design issues for schools to address when implementing a collaborating strategy. Firstly, whether to provide students with a private space, public space or allow their students to select their own spaces. Secondly, how to connect the students so that networks can be formed, and whether purpose built aggregation tools are required to achieve this.

Personal Learning Networks involve learners connecting and communicating via a selection of social media tools. The “personal” refers to the learner’s ability to select both the tools for their specific learning needs, and to select the sources to connect with. The learner would then use this personally constructed network to access learning content and construct knowledge. There is no requirement for all users in a personal learning network to use the same tools or connect to the same people.

Situated Learning is learning that occurs naturally as part of an ongoing immersive experience, such as the process of performing regular employment duties or undertaking a sporting activity. Collaborative learning networks allow learners to be immersed in their field of collaborative study where other learners share their ideas and opinions. If the network is large enough and passionate enough, then learners can be assured that their network will provide access to the latest ideas and developments as well experts with whom to interact.



Learning Activities

Using the collaborating strategy, the online learning community *can* provide all of the learner's learning needs. Learners may be part of one or more, formal or informal, online learning communities. These learners see their learning community or network as an indispensable part of their learning experience, however the learning is largely individual and their sense making purely personal.

Schools and classes using this strategy recognise the value of shifting the learning conversations and sense-making dialogue from the classroom to online. Learning is a natural consequence of being **situated** in a personal learning environment, where networks and connections provide both the initial motivation or inquiry and the means to realise it.

In reactions to other learners, they **contrast** their ideas, opinions and understandings and **incorporate** other's ideas and content into their own content. They **engage** with others in online knowledge construction activities, with the learning process being visible and transparent, with the learner clearly articulating their own learning and **change** in understanding for their own benefit and the benefit of others.

Contrasting

Learners using the collaborating strategy are more likely to consider the opinions of others and articulate their understandings in light of other arguments and points of view. They contrast their points of view, understanding and experiences, with that of other learners. Learners might comment in the space of the learner whose opinions they are contrasting or they may choose to respond in their own space. The contrasting activity may also take a various forms and formats, learners may use video or other multi-media to contrast their points of view and experiences.

When learners engage in contrasting activities it demonstrates an engagement and participation with other learners online. They have moved beyond simply responding with their own ideas and points of view, and are considering the ideas and points of views of others.

I agree with most of this but...

I think there is another school of thought that says...

Remixing

The activity of remixing demonstrates a willingness in the learner to use the content of others to construct knowledge. Rather than seeing knowledge construction as an individual, isolated activity, the online learner recognises the opportunity to reuse and improve online content. Learners remix content in a variety of forms. They may remix text content from a variety of sources to create a detailed and complete tutorial. They may remix video and audio to either reinforce the original message or to draw new insights.

Remixing is only possible when the original authors allow their materials to be remixed or where the remixer chooses to ignore copyright implications. Remixing relies on collaborative practices and views knowledge construction as a social activity.

Personal Sense Making

When they are sense making, learners draw conclusions and implications based on their prior experiences, understandings and other evidence. Learners intentionally engage in dialogue to clarify understanding and implications of concepts and ideas, sharing their ideas and considering others' responses. Learners apply newly constructed meaning to other experiences or ideas resulting in either consolidated or modified knowledge. This not only takes the form of text but also extended to other digital and multimedia products.

Sense making is a transparent activity where the learner articulates the change in understanding and what experience or new understanding has caused the new knowledge. By articulating their prior understandings and the process which has led to new understandings, they shed light not only on the knowledge but also on the knowledge construction process.

My thinking has been challenged...

I previously did this but now I do...

Rethinking Control

Students need to be able to design their own network.

Learning resides in the ability to form networks and learning how to learn is as important, if not more important, than learning itself. We need to ensure that students have control of their total learning experience. Additionally, students need control of their learning so they can learn how to design their learning experience. They need control over the context of their learning, who they learn with, how they learn, when they learn and how the learning is assessed. Schools that do not allow students to control their learning, deny their students the opportunity to learn how to learn.

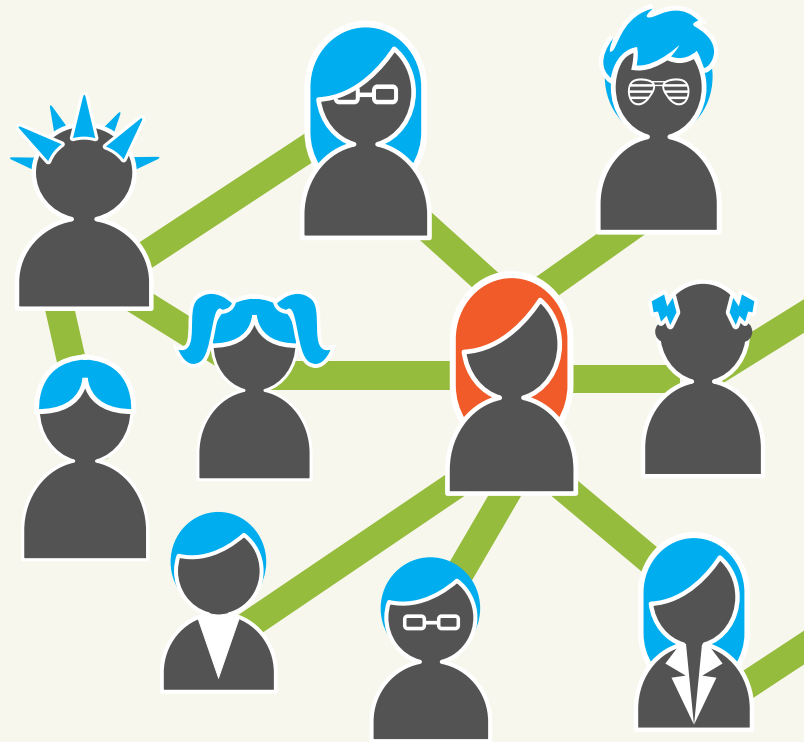
Having control results in personalised learning.

Granting students control over the context of their learning, results in students being able to personalise their learning. They personalise by selecting the other learners in their network. They personalise by selecting the tools they use and the formats of the content they interact with. They personalise their learning by not only having ubiquitous access, but also by choosing when to use it. They personalise their learning by controlling how their learning is presented, the format, the form and the location it is stored. We need to develop learners who are skilled at personalising their learning, as the changing nature of knowledge, means this is a fundamental skill for today's workforce.

Imagining a new teacher role.

Can we imagine a new role for the teacher who is no longer the sole deliverer of expert instruction, no longer the curriculum designer and no longer the assessor? Some have suggested that the teacher should be "the guide on the side" but perhaps that doesn't do the teacher's role justice. If learning occurs in learning networks, maybe the teacher's role is that of a network or community nurturer?

Perhaps, this community nurturer will model best practice in self-directed personalised learning. They may model by participating in the learning community, demonstrating how to learn, mentoring students as they design their learning networks and suggesting new ideas, approaches and goals.



Rethinking Participation

Schools cannot compete with learning networks on currency.

While traditional education instructional models remain dependent on the quality of individual teachers, they will be unable to compete with instruction available on the Internet. Further to this, they are unable to compete with networks in the currency, depth or breadth of content and knowledge. Through their sheer size and immersion, networks are designed to identify any new developments or ideas as they are developed. Similarly, participating in a learning network will expose learners to a wider range of views, and through personalised investigation, the opportunity to delve deeper into areas of interest. Schools should therefore leverage learning networks whenever possible.

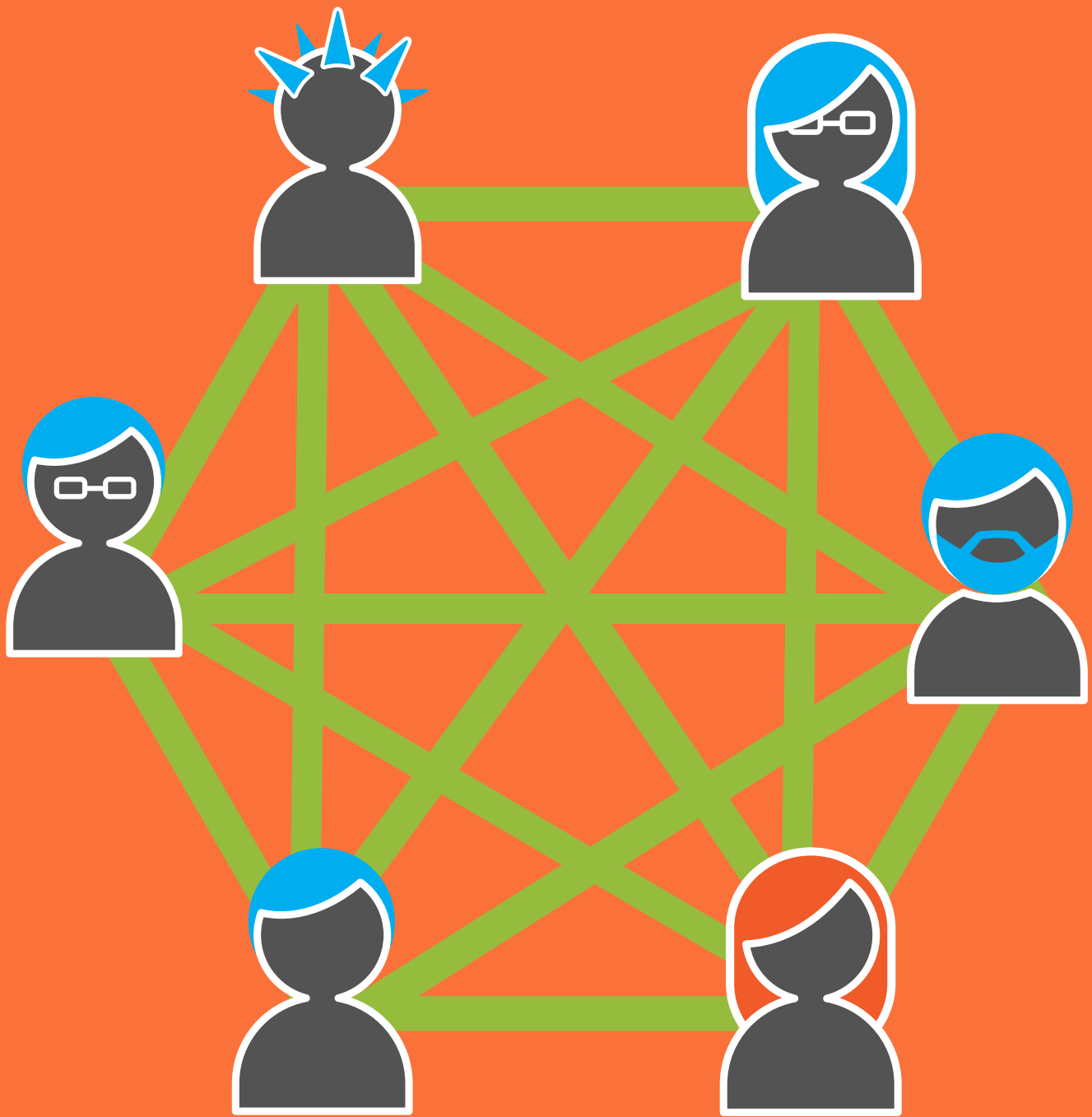
Participation in networks produces exponential benefits.

According to Reed's Law⁹ the benefits of a network is exponentially related to its size. The greater the size of the network, even if there is low peer to peer interconnectedness, the greater the quality, currency, breadth and depth that will result. A larger network is less likely to miss important new information and therefore more likely to be current. A larger network is more likely to have a greater diversity of views, experiences and knowledge, and is more likely to contain a greater number of experts to provide deeper knowledge and expertise.

Reed's Law emphasizes the importance of establishing networks between smaller groups or networks. Classes or schools who form insular networks are missing important network benefits or relying too heavily on important nodes, usually the teacher, to form connections with the wider network.

Participation in networks changes the student role.

If the utility of learning networks exponentially increases with size, this is because all members participate. To achieve this, Henry Jenkins¹⁰ asserts, "all members must feel that they can participate." Learning networks that are dominated by a few, whether or not they are experts, are not networks. Ensuring that there is ubiquitous access to the network at both school and home is the first challenge, Jenkins calls this the "**participation gap**." Schools also need to ensure that their students have specific skills and knowledge, to identify appropriate and meaningful ways to participate in learning networks.



Learning Collectively

Learning Collectively

The web makes it easy to **form groups** around **topics**, **ideas** and **content**. These special networks are distinguished by their high **interconnectedness** and **collective investigation**⁴.

Collectives are identifiable by their membership, though this may be organic, organised formally or informally, and is not size dependent. Despite being a co-construction of knowledge, collective learning is characterised as highly autonomous and diverse.

Using this strategy, learners move from an individual construction of knowledge and view knowledge as manifest in the collective. The construction of knowledge is a shared understanding around the specific concept and its implications. They identify their learning investigations within a collective understanding and seek to share all of their ideas and findings. Members engage in shared projects and knowledge building activities that negotiate the meaning of an idea, concept or project.

Learners contrast new knowledge with others and their own experiences to confirm or modify existing knowledge. Being able to articulate and share a collective understanding or summation of the shared knowledge about the area of interest is crucial. To that end, these learners curate, synthesise and collectively construct new knowledge and identify the resulting implications.

Learning Collectives are best served when they have an online focal point. This may be a website or other online space but they can exist across a distributed space. A learning collective that operates within a defined online space, has a clear membership with clearly defined norms. Without a specific coordinating space, fuzzy collectives are less clearly defined, have more fluid norms and usually require high profile active members that take on a role of illuminating quality contributions so that the entire collective is aware of them.

Despite the defined membership and the shared norms, learning collectives operate with autonomy and diversity, and enable members to cope with the volume of information by only engaging in knowledge building in areas of personal interest and opportunity. Learning collectively is most powerful when knowledge is co-constructed and investigations are aided by findings in other areas, which in turn lead to new areas of investigation.

Stack Overflow

stackoverflow.com

Stack Overflow is an online question and answer community for computer programmers. Stack Overflow encourages co-creation and co-authoring by allowing editing of content by other users so that the overall quality of the content can be improved. They also allow users to rate the quality of the content to assist others in evaluating its value. Additionally, these ratings are used to assess the value of the author, with valuable members of the community able to perform administration and community nurturing functions.

Stack Overflow currently has close to one million questions and two and half million answers, on average a question takes seven minutes to be answered.



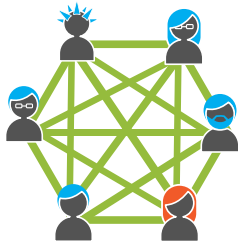
Massive Open Online Courses

connect.downes.ca

George Siemens and Stephen Downes developed the Massive Open Online Course concept with the model catering to the needs of self-organised learners. The design allows course participants to self-select areas of interest and method of study as well as providing a means for participants to find and connect with others with similar interests. Course conveners provide the focal point of the course and seek to nurture the community by identifying noteworthy participant contributions. A MOOC is not a “one size fits all” course but recognises that participants bring unique prior knowledge and learning needs that the course must cater for.



Learning Collectively



Social
Learning

Object
Centered
Sociality

Pedagogical Approaches

The learning collectively strategy can replace learning in traditional offline communities with learners using this strategy not necessarily needing the support of an offline learning community.

Learners operating at this phase are more likely be learning as part of a self-directed professional learning program.

This is not to suggest that the communicating strategy is not applicable for offline learning communities but rather points to the role of the teacher as the learning community nurturer.

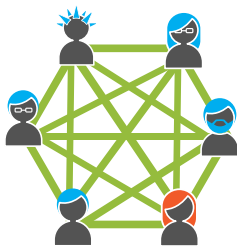
Schools seeking to implement a project based or self directed approach to curriculum design would find it appropriate to implement the learning collectively strategy. With the emphasis on co-construction and collective investigation highly suited to project or passion based learning.

There are two main design issues for schools to address when implementing a learning collectively strategy. Firstly, does the collective focus on an online space or through specific high profile members, such as when high profile experts build up a collective around their ideas while at the same time relinquish control over them? These experts still provide a focal point for the collective but it is for organization and dissemination of information, not authority and control. If the authoritative teacher becomes the focal point of the collective will this limit the diversity and autonomy? Secondly, do schools provide the infrastructure to ensure a high level of interconnectedness among the students or do they rely on the students to make the connections?

Object Centred Sociality suggests that user communities form around a common interest. Karin Knorr Cetina⁷, suggests that online communities must have a clear reason or purpose for their existence and they must facilitate the sharing of the object of learning. Conversely, without having a clear common passion or purpose online communities will fail. When encouraging collectives to form, schools need to recognise that networks need a point of relevance.

Social Learning is defined by Mark Reed⁶ “as a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks.” In particular, Social Learning describes learning that is transformational, not just for individuals but for the collective as a whole.

Learning Collectively



Curation

Synthesis

Collective
Meaning
Making

Learning Activities

With the learning collectively strategy, online knowledge construction moves from an individual pursuit to a collective one.

The learner belongs to a specific, identifiable collective, where shared understanding and knowledge is articulated and negotiated. Resources and ideas are curated and synthesised and new knowledge constructed by the collective rather than by individuals.

Schools and classes utilising this strategy, view learning as social, where ideas and concepts are developed together, resulting in a change in understanding for all members. This is not to suggest that all members will have the same beliefs or opinions, but rather that the range of concepts, ideas and implications held within the collective will be understood by all. By leveraging collective intelligence it is also envisioned that the resultant quality will be higher.

For collectives to learn together all members must operate with openness and transparency and relinquish their claims of intellectual property. Learners curate content from a wide variety of high quality sources, they synthesise the ideas and concepts of others, and they seek to construct collective meaning as opposed to personal knowledge.

Curation

Collective curation involves the collection of content and resources that represent the major or definitive views of the collective around a concept or an idea. Curation recognises that there are diverse opinions, ideas and approaches within the collective, and capturing and articulating these diverse views is crucial in representing the complete knowledge of the collective.

A curator takes responsibility for creating a complete and balanced selection of digital content so that it can meet a wide range of future learning needs. When forming a collection curators attempt to select diverse, complete and high quality content. Curated digital content may be housed in one place or may be hyperlinked so as make a collection.

Synthesis

Similar to curation, synthesis involves blending of all arguments, considerations and points of views in order to clearly articulate an idea or concept. For example, a Wikipedia page attempts to provide a concise explanation of a concept or idea, including points of contention, criticisms and alternate points of view. Synthesis represents the collective understanding around a topic, not the author's point of view.

A document that synthesises knowledge might be authored by a single author or may be coauthored by the whole collective. It may be a record of knowledge at a particular time or a living document that is improved as new ideas and knowledge are developed.

Collective Meaning Making

Collective Meaning Making is process by which a collective constructs new knowledge. Through shared negotiation, reflection and clarification, knowledge is first introduced and then accepted, often leading to new opportunities or areas of inquiry. Through experiences and reflection built upon previous agreements and shared understanding, new knowledge is integrated into the collective knowledge. This may be knowledge that gives a deeper understanding, knowledge that widens the implications or knowledge that identifies new implications previously not considered.

Collective Meaning Making relies on an exchange of ideas only possible when there is a high degree of interconnectedness, a readiness to work together and a willingness to find agreement in articulating the new knowledge.

Rethinking Openness

Knowledge is no longer based on authority but on connections.

Contemporary knowledge is characterised as current, accessible and socially constructed. A model of interconnected dialogue, with new knowledge visible and socially constructed, has replaced expert and authority broadcasted information. Those who want to stay relevant in this new blended, co-constructed world need to immerse themselves in the conversation by participating in open practice.

Transparency improves quality and relevance.

Openness improves quality and ensures relevance. If classes and schools are to stay relevant, then they must embrace openness and allow the outside world to influence and even transform what and how they teach. Learning networks have the ability to share new ideas and techniques as they are developed. Students need to have the ability to form networks as they learn how to learn.

Are interconnectedness and autonomy dissonant?

At first glance, requiring both a high level of interconnectedness in a learning network and membership in a collective, seem the direct opposite of autonomous learning. However collectives that value openness, realise that the freedom of autonomous investigation will increase the depth and breadth of the inquiry. By encouraging members to respond to new knowledge in ways that best suit their needs, interests and passions as well as providing ways for them to feed back their findings to the collective, this results in the collectives being both highly connected, diverse and autonomous. Autonomy is a major strength of collective investigation. It prevents all members from investigating the same areas, it harnesses the expertise and passions of its members and it encourages participation.

Rethinking Ownership

Are schools prepared to respond to the changing nature of copyright?

Traditional education is both heavily influenced by a traditional view of copyright and knowledge as a personal construct. For schools to take a contemporary approach to copyright, they need to consider the mass adoption of fair use licenses both for instructional content and student content.

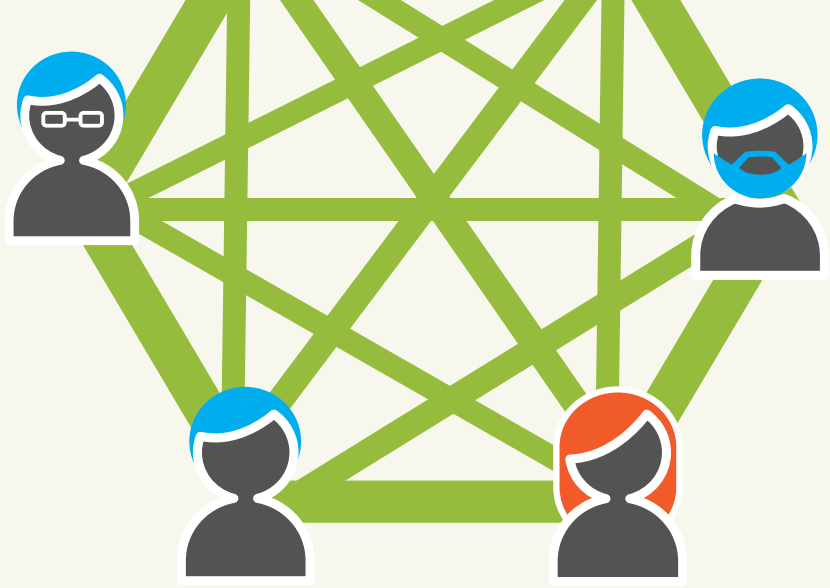
Creative Commons¹¹ provides copyright licenses and tools, suitable for educators and students. By embracing these types of copyright licenses, that allow and encourage reuse and remixing, schools can be well positioned to leverage the opportunities that coproduction make possible.

The need for a new kind of authority.

Relinquishing any claims of ownership, does not necessarily mean that no members have claims on ownership and authority. Collectives need new models for authority. Perhaps a new model of authority can be based on participation and quality contributions? Some online communities that leverage practices based on collective intelligence have used game mechanics to assess both the level of participation and the quality of their actions. Members that are identified as offering high level value to the collective are then rewarded with increased authority within the collective space. These members are then allowed to implement functions generally associated with authority.

How does coproduction change learning?

Learning Collectives construct knowledge as a unit believing that coproduction and thus collective intelligence, produces better outcomes than individual production. Coproduction not only involves the collective creation of artifacts but also the collective development of terms and concepts. Learning Collectives need to be governed by a shared understanding that for knowledge to be collectively constructed there must be willingness for shared and open ownership. While individuals seek to control and assert ownership of terms and concepts there cannot be individual claims on authority over the terms.



A Need for Collective Learning Environments

The challenge for schools is how to foster collective learning. There is a need for a new class of learning environments, let's call them Collective Learning Environments. These collectives allow learners to co-construct quality knowledge content, connect with other passionate self-directed learners, undertake projects and engage in collective investigation.

What might these Collective Learning Environments look like and what are the opportunities for teaching and learning?

There must be an object at the heart of the collective inquiry.

Although a high level of interconnectedness is an identifier of a collective, collectives are not formed as a result of the connections, but rather are formed around an object of inquiry. The object of inquiry would be a topic, concept or an emerging idea. The act of joining the Collective Learning Environments indicates a desire to join the collective. The community also serves as the major publishing hub and as a means to disseminate information if content is published by members in other spaces. It may be still possible for collectives to form without a central membership, but in this case, members would need to identify themselves as being part of a named collective investigating a named object, concept or idea.

The object must be considerably broad to encourage diversity.

If the collective has too narrow of a focus there will not be enough opportunities for diverse investigation. The design of the community and space must not be constraining in such a way that members do not have the freedom to explore unique areas of interest. Rather than using fixed systems to define areas of inquiry, Collective Learning Environments should use an open folksonomy (or tag) based system to encourage freedom in inquiry. Similarly, open membership, both by allowing anyone to join and also by lowering the barriers to contributing, should be encouraged to increase diversity and participation.

All views must be recognised and encouraged.

If collective learning is to be supported then there must be systems in place to encourage and support differing ideas and points of view. Collective Learning Environments should be designed to support multiple views around the same concept and provide ways to recognise this. Any aggregation or quality systems should use transparent mechanisms so as not give the appearance of bias or censorship. Collective Learning Environments should harvest collective intelligence by enabling co-production, allowing multiple members to improve the same content. This should be structured in a way that supports autonomy and diversity and does not result in arguments or turf warfare.

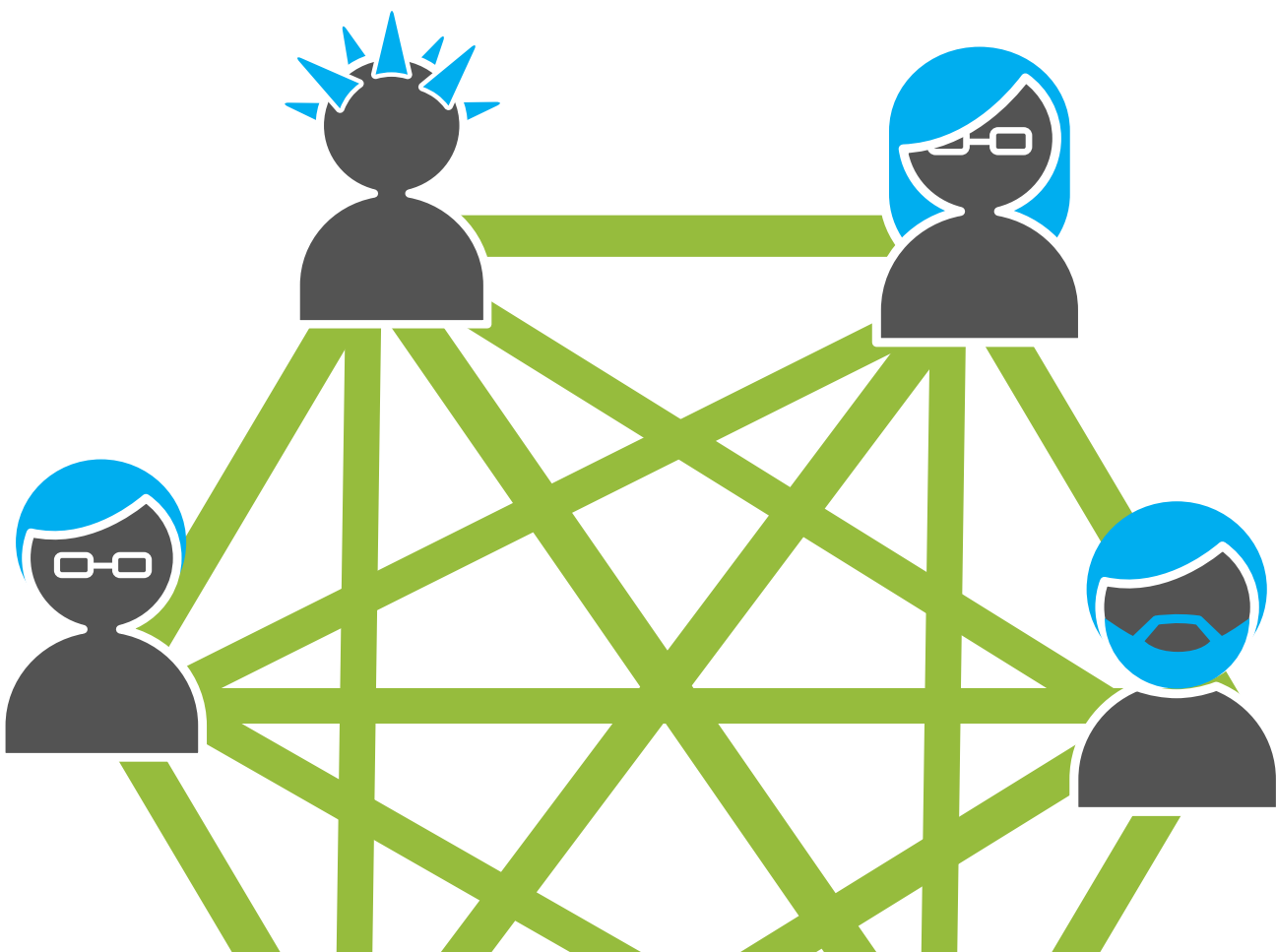
Autonomy must be encouraged.

Content must be structured in a way to support innovation, similar to the methods used in the open source projects where there are mechanisms to enable members to take projects in new directions. Collective Learning Environments should facilitate “peering,” the ability of members or a group of members to work in parallel with an original project, and “forking,” the ability of members, or a group of members, to take a project in a new direction. Forking and peering are seen as legitimate activities and do not need permission from the original project or content owner. These practices help support a climate of innovation and autonomy. Results of peered or forked investigation may or may not be fed back into the original investigation.

Quality knowledge and participation must be able to be identified and nurtured.

Finally, Collective Learning Environments must provide the structures to identify quality both in knowledge and participation. Collective rating of content is one way that is used to identify quality; similarly engagement with content may represent quality. Collective Learning Environments may seek to improve the quality of its knowledge by providing increased roles for quality participants, who have demonstrated an increased commitment to the collective, and allow them to further identify and improve the environment’s content.

Collective Learning Environments offer an opportunity for self-directed learning, they recognise that knowledge is constructed through the specific inquiry of passionate learners. They recognise that knowledge isn’t static, that new insights and techniques are continually emerging. They offer an opportunity for learners to learn together and undertake collective investigation with other passionate learners. Collective Learning Environments offer schools, teachers and learners, a new opportunity....



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